



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

| APPLICATION NO.       | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------------|-------------|----------------------|---------------------|------------------|
| 10/661,452            | 09/12/2003  | Yongsheng Liu        | AVA-P013            | 7807             |
| 47389                 | 7590        | 01/11/2006           | EXAMINER            |                  |
| BOUTSIKARIS, LEONIDAS |             |                      |                     |                  |
| ART UNIT              |             | PAPER NUMBER         |                     |                  |
|                       |             | 2872                 |                     |                  |

DATE MAILED: 01/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

SF

|                              |                 |              |  |
|------------------------------|-----------------|--------------|--|
| <b>Office Action Summary</b> | Application No. | Applicant(s) |  |
|                              | 10/661,452      | LIU ET AL.   |  |

  

|                 |          |  |
|-----------------|----------|--|
| Examiner        | Art Unit |  |
| Leo Boutsikaris | 2872     |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 23 May 2005.
- 2a) This action is **FINAL**.                            2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) 18 is/are allowed.
- 6) Claim(s) 1,12 and 19 is/are rejected.
- 7) Claim(s) 2-11 and 13-17 is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 12 September 2003 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.

- 4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Miao (US 2004/0184696).

Regarding claim 1, Miao discloses an optical system comprising:

an input 1;

a first polarizing port 10 optically coupled to the input;

a first polarization modulator (21, 22) optically coupled to the first polarizing port;

a polarizing beam splitter (“PBS”) having a first side that is optically coupled to the first polarization modulator at a side opposite to the first polarizing port;

a second polarization modulator (121, 122) optically coupled to the PBS at a second side of the PBS that is opposite to the first side;

a second polarizing port 110 optically coupled to the second polarization modulator at a side opposite to the PBS; and

a multiple-channel output 101 optically coupled to the second polarizing port (Fig. 1, [0006]-[0011]). It is noted that the above system is used in optical networks where WDM signals, i.e., multiple channel signals are used.

Regarding claim 12, the system also comprises  
a polarization modulator (221, 222) optically coupled to the PBS at a side of the PBS that is not parallel to the first side;  
a polarizing port 210 optically coupled to the polarization modulator (221, 222) at a side opposite to the PBS; and  
a multiple-channel output 201 optically coupled to the polarizing port 210 (Fig. 1).

Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Koh (US 2005/0030623).

Koh discloses an optical system comprising:  
an input;  
a first polarizing port 11 optically coupled to the input;  
a first polarization modulator 81 optically coupled to the first polarizing port;  
a polarizing beam splitter (“PBS”) 71 having a first side that is optically coupled to the first polarization modulator at a side opposite to the first polarizing port;  
a second polarization modulator 81 optically coupled to the PBS at a second side of the PBS that is opposite to the first side;  
a second polarizing port 11 optically coupled to the second polarization modulator at a side opposite to the PBS; and

a multiple-channel output 1 optically coupled to the second polarizing port (Fig. 3, [0025], [0029]). It is noted that the above system is used in optical networks where WDM signals, i.e., multiple channel signals are used.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu (US 6,134,358).

Regarding claim 1, Wu discloses an optical system comprising:

an input 912a;

a first polarizing port 924a optically coupled to the input;

a first polarization modulator 926a optically coupled to the first polarizing port;

a polarizing beam splitter (“PBS”) having a first side that is optically coupled to the first polarization modulator at a side opposite to the first polarizing port;

a second polarization modulator 932a optically coupled to the PBS at a second side of the PBS that is opposite to the first side;

a second polarizing port 934a optically coupled to the second polarization modulator at a side opposite to the PBS; and

a multiple-channel output 916a optically coupled to the second polarizing port (Fig. 9A, lines 10-48, col. 7). It is noted that the above system is used in optical networks where WDM signals, i.e., multiple channel signals are used.

Regarding claim 12, the system also comprises

a polarization modulator 932b optically coupled to the PBS at a side of the PBS that is not parallel to the first side;

a polarizing port 934b optically coupled to the polarization modulator 932b at a side opposite to the PBS; and

a multiple-channel output 918a optically coupled to the polarizing port 210 (Fig. 9A).

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Bergmann (US 5,930,028).

Bergmann discloses an optical system comprising:

an input H;

a first polarizing port 66 optically coupled to the input;

a first polarization modulator 68 optically coupled to the first polarizing port;

a polarizing beam splitter (“PBS”) 60 having a first side that is optically coupled to the first polarization modulator at a side opposite to the first polarizing port;

a second polarization modulator 70 optically coupled to the PBS at a second side of the PBS that is opposite to the first side;

a second polarizing port 72 optically coupled to the second polarization modulator at a side opposite to the PBS; and

a multiple-channel output M optically coupled to the second polarizing port (Fig. 5, lines 37-64, col. 4). It is noted that the above system is used in optical networks where WDM signals, i.e., multiple channel signals are used.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wu (US 6,134,358) in view of Shani (US 6,259,834).

Wu discloses all the limitations of said claim except for showing an arrangement where a pair of switches as the one depicted in Fig. 9A are connected in series. Shani discloses an optical switch network comprising a series of stages 62, 64, 66 connected in series, each stage comprising optical switches (Fig. 9, lines 1-14, col. 14). It would have been obvious to one of ordinary skill in the art at the time the invention was made to connect two (or more) switches disclosed by Wu, as taught by Shani, for the purpose of interconnecting a larger amount of input and output waveguides (see lines 1-3, col. 14, in Shani).

***Allowable Subject Matter***

Claims 2-11, 13-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 18 is allowed.

Claims 2-11, 13-18 are allowable over the prior art of record for at least the reason that even though the prior art discloses optical systems comprising a polarizing port (e.g., a

birefringent crystal) and a polarization modulator (e.g., a liquid crystal cell changing the polarization of incident light signal in response to a modulation signal) on two different sides of a polarizing beam splitter, the prior art fails to teach or reasonably suggest, regarding claims 2-8, 10-11, a reconfigurable channel dropping demultiplexer comprising a first quarter wave plate optically coupled to the PBS at a third side of the PBS that is not parallel to either of the first two sides, regarding claims 13-17, a reconfigurable channel dropping demultiplexer comprising a first quarter wave plate optically coupled to the PBS at a side s2 of the PBS that is opposite to the first side s1, and regarding claims 9, 18, a reconfigurable channel dropping demultiplexer comprising an isolator core optically coupled to the PBS at a third side of the PBS that is not parallel to either of the first two sides, as set forth by the claimed combination.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Leo Boutsikaris whose telephone number is 571-272-2308.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LEONIDAS BOUTSIKARIS  
PRIMARY EXAMINER  
  
Leo Boutsikaris, Ph.D., J.D.  
Primary Patent Examiner, AU 2872  
January 6, 2005